

9.04  
1580

**ECONOMICS OF ALTERNATIVE  
MANURE HANDLING SYSTEMS**

**DAIRY -- BEEF -- SWINE**

**GUIDELINES AND RESOURCE MATERIALS  
FOR EDUCATIONAL MEETINGS**

**BY**

**ALLEN E. LINES  
EXTENSION ECONOMIST  
FARM MANAGEMENT**

**THE OHIO STATE UNIVERSITY  
COLUMBUS, OHIO  
MARCH 1982**

COMPONENTS AND CAPITAL COSTS  
DAIRY MANURE HANDLING SYSTEM  
150 COWS - DAILY SPREAD  
1982 - 1983

ITEM	NEW COST	LIFE (YRS)	DIRTI (%)	PERCENT TO MANURE	ANNUAL FIXED COSTS
SKID -- STEER					
SCRAPER / LOADER (30 HP)	\$ 17,300	10	22	85	\$ 3235
FLAIL SPREADER	9,200	2	63	100	5796
TRACTOR (100 HP)	28,800	10	22	20	1267
					TOTAL \$ 10298
INTEREST @ 14 % / YR @ 1/2 NEW COST					

.5

COMPONENTS AND CAPITAL COSTS  
DAIRY MANURE HANDLING SYSTEM  
150 COWS - EARTHEN STORAGE  
1 YEAR STORAGE  
1982 - 1983

ITEM	NEW COST	LIFE (YRS)	DIRTI (%)	PERCENT TO MANURE	ANNUAL FIXED COSTS
SKID - STEER SCRAPER (30 HP)	\$ 17,300	10	22	85	\$ 3235
EARTHEN POND / PUSH OFF 150,000 CU. FT. 20' X 60' CONCRETE	16,000	20	13	100	2080
PUMP - AGITATE / REMOVE (10')	5,800	5	32	100	1856
PUMP TRACTOR (100 HP)	28,800	10	22	14	887
TANK WAGIN 3250 GAL INJECTORS	16,500	8	25	100	4125
WAGON TRACTOR (125 HP)	39,600	10	22	10	871
TOTAL					\$ 13,054
INTEREST @ 14 % / YR @ 1/2 NEW COST					

ANNUAL OPERATING COSTS  
DAIRY MANURE HANDLING SYSTEMS  
150 COWS  
1982 - 1983

MANURE HANDLING SYSTEM	BEDDING (50¢ / 40 LB BALE)	DIESEL FUEL (\$1.25 / GAL)	ELECTRIC (6¢ / KWH)	LABOR* (\$5 / HR)	TOTAL
DAILY SPREAD (2 LOADS / DAY)	\$ 5,000	\$ 2,260	---	\$ 2,775 (455 HRS)	\$ 10,035
ABOVE GROUND PLANK WALLS	10,500	1,270	---	2,175 (435 HRS)	13,945
EARTHEN STORAGE	3,000	2,780	---	2,200 (440 HRS)	7,980
ABOVE GROUND TANK	3,000	2,040	320	1,975 (395 HRS)	7,335

INCLUDES 274 HOURS FOR SKID - STEER SCRAPING (45 MIN / DAY)

9

NET ANNUAL COSTS  
DAIRY MANURE HANDLING SYSTEMS  
150 COWS  
1982 - 1983

MANURE HANDLING SYSTEM	FIXED (+) COSTS	OPERATING (-) COSTS	NUTRIENT (=) VALUE	NET ANNUAL COSTS
DAILY SPREAD	\$ 10,298	\$ 10,035	\$ 4,403	\$ 8,930*
ABOVE GROUND PLANK WALLS	9,187	13,945	11,046	10,086*
EARTHEN STORAGE	13,054	7,980	11,067	9,967**
ABOVE GROUND TANK	21,439	7,335	11,759	17,015**

\* COSTS FOR HANDLING MILKING CENTER WASTES NOT INCLUDED

\*\* COSTS FOR HANDLING MILKING CENTER WASTES ARE INCLUDED

COMPONENT AND CAPITAL COSTS  
BEEF MANURE HANDLING SYSTEM  
1000 HEAD - EARTHEN STORAGE: PISTON PUMP  
6 MONTHS STORAGE  
1982 - 1983

ITEM	NEW COST	LIFE (YRS)	DIRTY 5 (%)	PERCENT TO MANURE	ANNUAL FIXED COSTS
CONCRETE FLOOR 30,000 SQ. FT.	\$ 45,000	20	13	50	\$ 2925
SKID - STEER SCRAPER / LOADER (30 HP)	17,300	10	22	85	3235
COLLECTION GUTTER SUMP / PIPE	3,900	20	13	100	507
PUMP AGITATE / TRANSFER 15 HP ELECTRIC	9,600	10	20	100	1920
EARTHEN POND PUMP	14,000	20	13	100	1820
AGITATE / REMOVE	10,000	5	32	100	3200
PUMP TRACTOR (100 HP)	28,800	10	22	14	887
TANK WAGON (3250 GAL) INJECTORS	16,500	8	25	100	4125
WAGON TRACTOR (125 HP)	39,600	10	22	10	871
TOTAL					\$ 19,490

INTEREST @ 14% / YR @ ½ NEW COST

ANNUAL OPERATING COSTS  
BEEF MANURE HANDLING SYSTEMS  
1,000 HEAD @ 900 LBS.  
1982 - 1983

MANURE HANDLING SYSTEM	DIESEL FUEL (1.25/GAL)	ELECTRIC (6¢/KWH)	LABOR (\$5/HR)	TOTAL
PIT: TOTAL SLATS	\$3163	- - -	\$1550	\$4713
EARTHEN STORAGE: PISTON PUMP	5900	324	1850	8074
ABOVE GROUND TANK: SCRAPER	3625	660	1750	6035

NET ANNUAL COSTS  
BEEF MANURE HANDLING SYSTEMS  
1,000 HEAD @ 900 LBS.

1982 - 1983

MANURE HANDLING SYSTEM	FIXED COSTS (+)	OPERATING COSTS (-)	NUTRIENT VALUE (=)	NET ANNUAL COSTS
PIT/TOTAL SLATS	\$23,306	\$4,713	\$16,759	\$11,260
EARTHEN STORAGE/ PISTON PUMP	19,490	8,074	17,544	10,020
ABOVE GROUND TANK/ SCRAPER	42,813	6,035	18,631	30,217



.17

COMPONENTS AND CAPITAL COSTS  
FINISHING HOG MANURE HANDLING SYSTEM  
1,000 HEAD - PAVED LOT/SHELTER  
1982 - 1983

ITEM	NEW COST	LIFE (YRS)	DIRT 5 (%)	PERCENT TO MANURE	ANNUAL FIXED COSTS
CONCRETE LOT 6 SQ. FT./HOG	9,000	20	13	50	\$585
RUNOFF CONTROL SETTLING BASIN INFILTRATION	4,000	20	13	100	520
SKID - STEER SCRAPER/LOADER (30 H.P.)	17,300	10	22	85	3,235
FLAIL SPREADER 1,420 GAL.	9,200	4	38	100	3,496
TRACTOR (100 H.P.)	28,800	10	22	4	253
				TOTAL	<u>\$8,089</u>

INTEREST @ 14% / YEAR @ 1/2 NEW COST.

COMPONENTS AND CAPITAL COSTS  
FINISHING HOG MANURE HANDLING SYSTEM  
1000 HEAD -- NARROW GUTTER: GRAVITY TO TANK  
4 MONTHS STORAGE  
1982--1983

ITEM	NEW COST	LIFE (YRS)	DIRTY 5 (%)	PERCENT TO MANURE	ANNUAL FIXED COSTS
SKID-STEER SCRAPER/LOADER (30 HP)	\$17,300	10	22	85	\$3,235
FLAIL SPREADER	9,200	2	63	100	5,796
TRACTOR (100 HP)	28,800	10	22	20	1,267
				TOTAL	\$10,298

INTEREST @ 14% / YR @ 1/2 NEW COST

VALUE OF MANURE NUTRIENTS  
FINISHING HOG MANURE HANDLING SYSTEMS  
1000 HEAD @ 150 LBS.  
1982-1983

MANURE HANDLING SYSTEM	% RETAINED			VALUE			TOTAL
	N	P	K	N	P	K	
PIT / PARTIAL (50%) SLATS	60	90	90	\$3450	\$4207	\$2448	\$10,105
PAVED LOT / SHELTER	40	75	70	\$2300	\$3506	\$1904	7,710
FLUSHING TO LAGOON	20	50	40	\$1150	\$2337	\$1088	4,575
NARROW GUTTER / GRAVITY TO TANK	70	90	90	\$4025	\$4207	\$2448	10,680

POUNDS EXCRETER            N = 25,000; P = 8,200; K = 16,000

PRICE PER POUND        N = 23¢; P = 57¢; K = 17¢

NET ANNUAL COSTS  
 ALTERNATIVE MANURE HANDLING SYSTEMS  
 1982 - 1983

SYSTEM	NET ANNUAL COSTS
DAIRY (150 COWS)	
DAILY SPREAD	\$ 8,930
ABOVE GROUND / PLANK WALL	12,086
EARTHEN STORAGE	9,967
ABOVE GROUND TANK	17,015
BEEF (1000 HEAD @ 900 LBS.)	
PIT / TOTAL SLATS	11,260
EARTHEN STORAGE / PISTON	10,020
ABOVE GROUND TANK / SCRAPER	30,217
FINISHING HOG (1000 HEAD @ 150 LBS.)	
PIT / PARTIAL SLAT	-322
PAVED LOT / SHELTER	1,698
FLUSHING TO LAGOON	7,782
NARROW GUTTER / GRAVITY TO TANK	-1,713